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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,641	07/02/2003	Timothy P. McCaffrey	130954	4619
7590		12/23/2005	EXAMINER	
William J. Zychlewicz		KIM, TAE JUN		
Armstrong Teasdale LLP		ART UNIT		
Suite 2600		PAPER NUMBER		
One Metropolitan Square		3746		
St. Louis, MO 63102		DATE MAILED: 12/23/2005		

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/613,641

Applicant(s)

MCCAFFREY ET AL.

Examiner

Ted Kim

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-20 is/are pending in the application.
4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
5) ☒ Claim(s) 13 and 15-20 is/are allowed.
6) ☒ Claim(s) 7-12 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/2005 has been entered.

Election/Restrictions

2. This application contains claims 1-6 drawn to an invention nonelected with traverse in the Paper of 11/09/2004. A complete reply should include cancellation of nonelected claims. See MPEP § 821.01.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 44 (page 4, last paragraph, line 4). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If

the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kraft et al (6,446,439) in view of either Shekleton et al (6,065,281) or Weiler (4,229,944). Kraft et al teach a primer nozzle for a gas turbine engine combustor including a centerline axis, said primer/pilot nozzle 39 (Fig. 4) or 206, 216 (Figs. 9-11) comprising: an inlet 250 and 120 coupled to a source of pressurized air (see air in Fig. 9 radially outwardly of 250); an injection tip for discharging fuel into said combustor in a direction that is substantially parallel to the gas turbine engine centerline axis; a body extending between said inlet and said injection tip, said body comprising at least one annular projection (e.g. 120, Fig. 2) for coupling said nozzle to said body such that said primer nozzle is positioned relative to the combustor; and a shroud 170 (Fig. 4) or 208 (Figs. 9-11) extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud comprising a

plurality of circumferentially-spaced openings (226, Figs. 9-11 and unlabeled in Fig. 4) for metering cooling air supplied to said injection tip. Kraft et al do not teach injector coupled in flow communication to a recuperator for receiving cooling air therefrom. Shekleton et al teach a gas turbine engine combustor where the fuel injector 14 is coupled in flow communication to a recuperator 23 (Fig. 1) for receiving cooling air therefrom (col. 5, lines 55+). Using a recuperator allows for greater thermal efficiency as heat is recovered from the exhaust gases. Weiler teaches a shroud extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud 17 comprising a plurality of circumferentially-spaced openings 7, 8 for metering cooling air supplied to said injection tip; wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip comprising a plurality of cooling openings 25, wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip is frusto-conical; wherein said shroud plurality of circumferentially-spaced openings facilitate limiting an airflow therethrough if said shroud tip deteriorates. The openings are coupled in flow communication to a recuperator for receiving cooling airflow therefrom (col. 4, lines 5-21), where the recuperator enhanced the thermal efficiency by recovering heat from the exhaust and the cooling airflow reduces coking/carbonizing (col. 1, lines 29+). It would have been obvious to one of ordinary skill in the art to employ a recuperator coupled to the injector of Kraft et al, in order to provide for greater thermal efficiency.

6. Claims 7, 8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lefebvre (3,283,502), and in view of Weiler (4,229,944). Lefebvre teaches a primer nozzle 10 for a gas turbine engine combustor including a centerline axis, said primer nozzle comprising: an inlet; an injection tip for discharging fuel into said combustor in a direction that is substantially parallel to the gas turbine engine centerline axis; a body extending between said inlet and said injection tip, said body comprising at least one annular projection for coupling said nozzle to said body such that said primer nozzle is positioned relative to the combustor; said primer nozzle configured to supply fuel to the gas turbine engine combustor only during engine start-up operating conditions (col. 4, lines 17+). Lefebvre does not teach a shroud for cooling the primer nozzle. Weiler teaches a shroud extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud 17 comprising a plurality of circumferentially-spaced openings 7, 8 for metering cooling air supplied to said injection tip; wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip comprising a plurality of cooling openings 25, wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip is frusto-conical; wherein said shroud plurality of circumferentially-spaced openings facilitate limiting an airflow therethrough if said shroud tip deteriorates. The openings are coupled in flow communication to a recuperator for receiving cooling airflow therefrom (col. 4, lines 5-21), where the recuperator enhanced the thermal efficiency by recovering heat from the exhaust and the

cooling airflow reduces coking/carbonizing (col. 1, lines 29+). It would have been obvious to one of ordinary skill in the art to employ a shroud and cooling air, as taught by Weiler, in order to prevent coking/carbonizing of the nozzles and use a recuperator to enhance the thermal efficiency.

7. Claims 7, 8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturgess (3,866,413) in view of Weiler (4,229,944). Sturgess teaches various aspects of the claimed invention but does not teach a shroud with circumferential air openings surrounding the primer/pilot nozzle 12. Weiler teaches a shroud extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud 17 comprising a plurality of circumferentially-spaced openings 7, 8 for metering cooling air supplied to said injection tip; wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip comprising a plurality of cooling openings 25, wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip is frusto-conical; wherein said shroud plurality of circumferentially-spaced openings facilitate limiting an airflow therethrough if said shroud tip deteriorates. The openings are coupled in flow communication to a recuperator for receiving cooling airflow therefrom (col. 4, lines 5-21), where the recuperator enhanced the thermal efficiency by recovering heat from the exhaust and the cooling airflow reduces coking/carbonizing (col. 1, lines 29+). It would have been obvious to one of ordinary skill in the art to employ a shroud and cooling air, as taught by Weiler, in order to prevent

coking/carbonizing of the nozzles and use a recuperator to enhance the thermal efficiency.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Lefebvre (3,283,502) or Sturgess (3,866,413), and in view of Weiler (4,229,944) as applied above, and further in view of either Stuttaford et al (6,675,581) or Bechtel et al (6,363,724). Lefebvre and Sturgess teach various aspects of the claimed invention but do not teach the coolant openings on the shroud tip for film cooling. Lefebvre teaches coolant openings 24 on the shroud tip for film cooling. Sturgess teaches coolant openings 58 on the shroud tip for film cooling. It would have been obvious to one of ordinary skill in the art to employ coolant openings on the shroud tip in order to provide film cooling thereof.

9. Claims 7, 8, 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Lefebvre (3,283,502) or Sturgess (3,866,413), and in view of Weiler (4,229,944) as applied above, and further in view of either Harper et al (4,041,695) or Davies et al (3,344,602). Lefebvre or Sturgess teach various aspects of the claimed invention but do not teach a pressurized air source/accumulator coupled to the inlet for purging residual fuel. Note that Weiler does teach using external air for purging the nozzles (col. 3, lines 45-51). Harper teaches using a pressurized air source/accumulator 82 coupled to the inlet for purging residual fuel during predetermined conditions (see abstract). Davies et al teach an air accumulator 110 coupled to the inlet for purging residual fuel from the fuel nozzles. It would have been obvious to one of ordinary skill in the art to employ a

pressurized air source/accumulator to reduce coking of the fuel injector and/or to expel all the fuel during shutdown.

Response to Arguments

10. Applicant's arguments filed 10/27/2005 have been fully considered and are persuasive with regard to claim 13 but they are not persuasive with regard to claim 7 and its dependents.

11. Applicant's central argument is with the new limitations added by amendment on 10/27/05 and these limitations have been fully addressed above.

12. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

13. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*,

958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine is expressly in the references and not from solely applicant's specification as alleged.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are

571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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